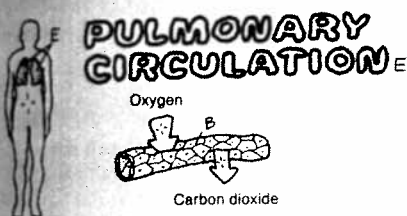
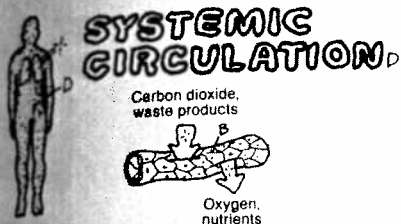


# IV. CARDIOVASCULAR SYSTEM

## SCHEME OF BLOOD CIRCULATION

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ON Use blue for A, purple for B, red for C, and very light colors for D and E (1) Color the titles for systemic and pulmonary circulation; the two figures; and the borders bracketing the large illustration. Also color purple (representing the transitional state between oxygenation and deoxygenation) the two capillaries, demonstrating the difference between capillary function in the lungs versus the body. (2) Begin in the right atrium of the heart and color the flow of deoxygenated blood (A) into the lungs. After coloring the pulmonary capillary network (B), color the oxygenated blood (C) that re-enters the heart and is pumped into and through the systemic circuit.



Circulation of blood begins with the heart which pumps blood into arteries and receives blood from veins. Arteries conduct blood away from the heart regardless of the amount of oxygen (oxygenation) in that blood. Veins conduct blood toward the heart, regardless of the degree of oxygenation of the blood. Capillaries are networks of extremely thin-walled vessels throughout the body tissues that permit the exchange of gases and nutrients between the vessel interior (vascular space) and the area external to the vessel (extracellular space). Capillaries receive blood from small arteries and conduct blood to small veins.

There are two circuits of blood flow: (1) the pulmonary circuit, which conveys deoxygenated blood from the right side of the heart to the lungs and freshly oxygenated blood back to the left side of the heart, and (2) the systemic circuit, which conveys oxygenated blood from the left heart to the body tissues and returns deoxygenated blood to the right heart. The color red is used universally for oxygenated blood; the color blue is used for deoxygenated blood.

Clearly, not all arterial blood is oxygenated (in the pulmonary circulation, arteries conduct deoxygenated blood to the lungs), and not all venous blood is deoxygenated (pulmonary veins conduct oxygenated blood to the heart).

Capillary blood is mixed; it is largely oxygenated on the arterial side of the capillary bed, and it is largely deoxygenated on the venous side, as a consequence of delivering oxygen to and picking up carbon dioxide from the tissues it supplies.

One capillary network generally exists between an artery and a vein; an exception is the portal circulation characterized by two capillary sets between artery and vein. The vein between the two networks is the portal vein. Such can be seen between the gastrointestinal tract and the liver.

DEOXYGENATED BLOOD<sub>A</sub>  
CAPILLARY BLOOD<sub>B</sub>  
OXYGENATED BLOOD<sub>C</sub>

